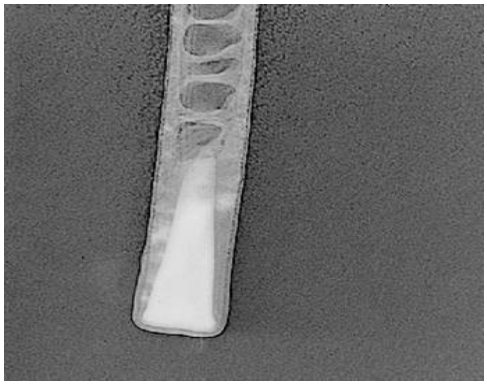

News from the Savannah River National Laboratory

May 31, 2005 For immediate release

Contact: Angeline French (803) 725-2854, angeline.french@srnl.doe.gov

Savannah River National Laboratory Hydrogen Project Selected

AIKEN, S.C. – The U.S. Department of Energy has selected a Savannah River National Laboratory research project on novel materials for hydrogen storage as part of their effort to make hydrogen fuel cell vehicles and refueling stations available, practical and affordable for American consumers by 2020. (See the May 25 DOE news release Department of Energy Announces $64 Million in Hydrogen Research & Development Projects in the "Press Room" at www.doe.gov for further details.) Expected funding for the SRNL project is estimated at approximately one-half million dollars a year for the next three years.

The SRNL-led basic science research project explores the role of nanotechnology in hydrogen storage, one of the key technological challenges that must be addressed to make the hydrogen economy a reality. SRNL is at the forefront of research to develop a low-cost solid-state hydrogen storage material that can safely hold and release significant quantities of hydrogen at a practical temperature. As a fuel for vehicles, solid-state storage of hydrogen would be simpler, safer and more reliable than storage as a liquid or gas.

"DOE's initiative will advance the scientific knowledge necessary to make hydrogen a part of our everyday energy supply," said Dr. G. Todd Wright, Laboratory Director of SRNL. "Being a part of this initiative is a real testament to the importance of the leading-edge hydrogen research that SRNL is conducting."

This project, led by SRNL's Dr. Ragaiy Zidan, Dr. Steven Serkiz and Dr. Scott McWhorter, will study the physical and chemical properties of carbon nanotubes, and the mechanisms that these tiny structures use to bond with hydrogen. Carbon nanotubes are long, thin structures (approximately 1/10,000 the width of a human hair), which can be pictured as a hexagonal lattice of carbon rolled into a cylinder.

Recent research has indicated that carbon nanotubes have great potential as a way to store hydrogen in a solid structure because they may be able to bond with large amounts of hydrogen at room temperature. This project will examine the effect when these structures are doped with a variety of different metals, and will relate physical and chemical properties, such as size, composition and defects, to the nanotubes' ability to bond with and release hydrogen. Researchers will use a combination of laboratory experiments and theoretical modeling to advance their understanding of how metal-doped carbon nanotubes can best be used in hydrogen storage.

SRNL is working with researchers from Virginia Commonwealth University, the Georgia Institute of Technology and Oak Ridge National Laboratory on the project, which is entitled "Elucidation of Hydrogen Interaction Mechanisms with Metal-Doped Carbon Nanostructures."

SRNL is also participating in three other projects, led by Washington University, the Massachusetts Institute of Technology and the University of North Carolina, that were selected as part of the same DOE initiative. Both the

Washington University and MIT projects relate to novel materials for hydrogen storage; Dr. Zidan is coordinating SRNL's role in these two. The UNC-led project is one of the Membranes for Separation, Purification, and Ion Transport projects selected by DOE; Dr. Thad Adams is SRNL's lead on this project.

Savannah River National Laboratory, the nation's newest National Laboratory, is located at the U.S. Department of Energy's Savannah River Site. Last year, the Secretary of Energy designated the laboratory, which has been serving DOE and the nation for over 50 years, as a National Laboratory. Washington Savannah River Company operates SRS, including SRNL, for the U.S. Department of Energy. WSRC is a wholly owned subsidiary of Washington Group International.

WSRC-05-22